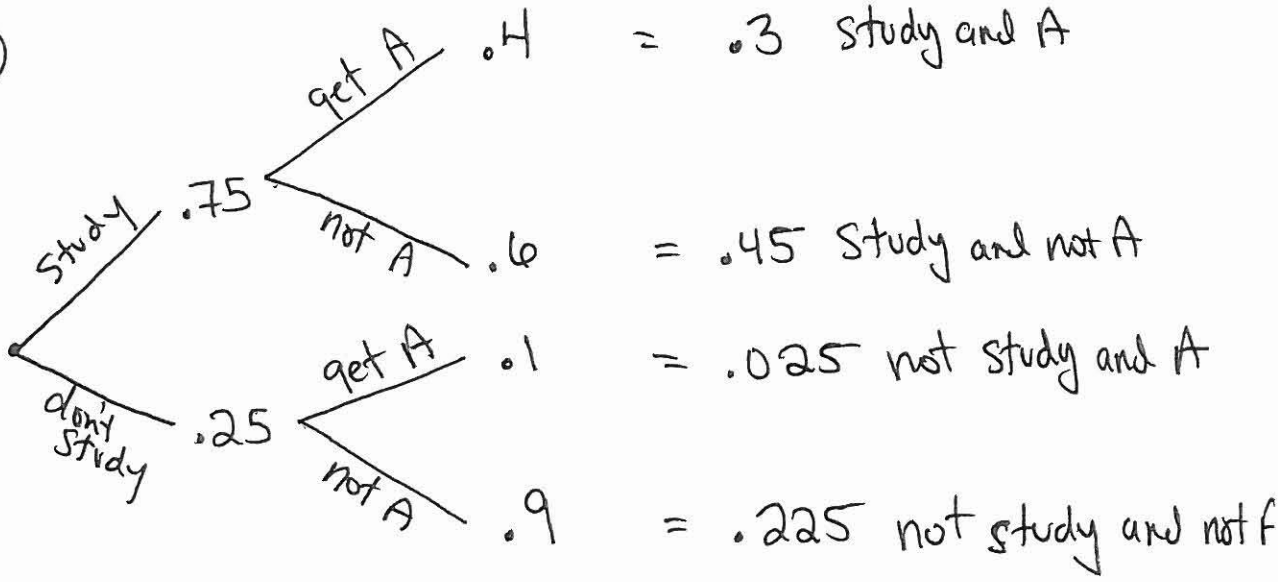
Multiple Choice

1. B
2. C
3. D
4. E
5. E
6. C
7. C
8. D
9. D
10. C
11. D
12. C
13. D
14. D
15. E
16. B
17. E

$$\frac{.3}{.3+.025} = \frac{.3}{.325} = .923$$

Open ended

(18)



$$P(\text{study} \mid A) = \frac{P(\text{Studied and A})}{P(A)}$$

$$= \frac{.3}{.3+.025} = \frac{.3}{.325} = \boxed{.923}$$

B = Boys
G = Girls

Open ended

(19) $E(B) = 74$ $SD(B) = 4.5$ $[Var(B) = 20.25]$
$E(G) = 70$ $SD(G) = 3$ $[Var(G) = 9]$

a) $E(B-G) = E(B) - E(G) = 74 - 70 = \boxed{4 \text{ inches}}$

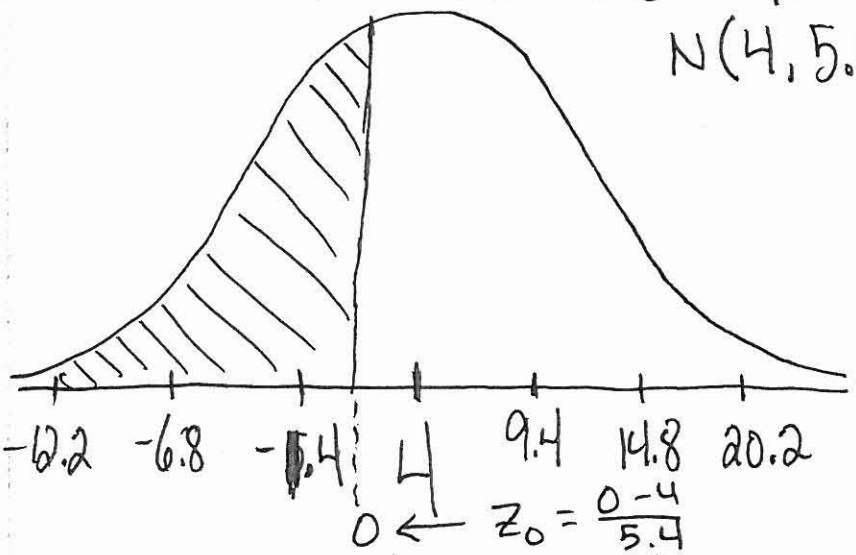
b) $Var(B-G) = Var(B) + Var(G) = 20.25 + 9 = 29.25$

$SD(B-G) = \sqrt{29.25} = 5.4$

c) This can be modeled using the normal curve (see problem)

$N(4, 5.4)$

← models differences in height $E(B-G)$



$P(y < 0) = P(Z < -.7407)$
$= .2294$

If difference $[E(B-G)]$ is less than zero, the girl is taller than the boy

∴ About 22.94% of teams (23%) will girl be taller than boy

Open ended

(20)

(a) ① There are only two outcomes -
success = credit card purchase
failure = other type of purchase
② Trials are independent (The outcome of one transaction does not influence the next transaction)
③ Probability of success is same for every trial ($p = .62$)

(b) This is Geometric

$$P(X=4) = (.38)^3(.62) = .034$$

(c) This is binomial

*Two ways to do problem:

① $P(X=10) + P(X=11) + \ldots + P(X=20)$

$$= \binom{20}{10}(.62)^{10}(.38)^{10} + \binom{20}{11}(.62)^{11}(.38)^{9} + \ldots + \binom{20}{20}(.62)^{20}(.3$$

② $1 - [\text{Probability of less than half}]$ OR

$$= 1 - [P(X=0) + P(X=1) + \ldots + P(X=9)]$$

$$= 1 - \left[\binom{20}{0}(.62)^{0}(.38)^{20} + \binom{20}{1}(.62)^{1}(.38)^{19} + \ldots + \binom{20}{9}(.62)^{9}(.3\right.$$

Or Calculator $1 - [\text{binomcdf}(20, .62, 9)]$ → .9877